



PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

AF 12874  
#14 App'd  
Brief  
1/6/03  
Hayes

In re application of

Docket No: A8032

Ting WANG, et al.

Appln. No.: 09/853,575

Group Art Unit: 2874

Confirmation No.: 7192

Examiner: M. Connelly-Cushwa

Filed: May 14, 2001

For: OPTICAL LUMINESCENT DISPLAY DEVICE

**SUBMISSION OF APPELLANTS' SECOND BRIEF ON APPEAL**

Commissioner for Patents  
Washington, D.C. 20231

Sir:

Submitted herewith please find an original and two copies of Appellant's Second Brief on Appeal. No fees are believed to be required with this submission. However, the USPTO is directed and authorized to charge any fees which may be required, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account. A duplicate copy of this paper is attached.

Respectfully submitted,

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Date: December 13, 2002

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**APPELLANTS' SECOND BRIEF ON APPEAL UNDER 37 C.F.R. § 1.192**

Commissioner for Patents  
Washington, D.C. 20231

Sir:

In reply to Notification of Non-Compliance dated November 29, 2002, the following comprises the Appellant's Second Brief on Appeal from the rejection dated April 17, 2002, wherein claims 1-5, 19, 20 and 43 were rejected for the second time. This is a Continuation Application of prior Application No. 09/246,145 filed February 8, 1999 of Ting WANG, Allan SCHWEITZER, and Maximilan OTT entitled OPTICAL LUMINESCENT DISPLAY DEVICE which issued as U. S. Patent No. 6,307,987 B1. This Second Appeal Brief is filed in triplicate and is believed to be in full compliance with the provisions of 37 C.F.R. § 1.192(c). The Notification of Non-Compliance was mailed November 29, 2002; therefore, the present Second Appeal Brief is timely filed.

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APPELLANTS' SECOND BRIEF ON APPEAL  
UNDER 37 C.F.R. § 1.192  
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**I. REAL PARTY IN INTEREST**

Appellant respectfully submits that the above-captioned application is assigned in its entirety to NEC RESEARCH INSTITUTE, a company organized under the laws of the United States of America.

**II. RELATED APPEALS AND INTERFERENCES**

Appellant states that, upon information and belief, Appellant is not aware of any co-pending appeal or interference which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**III. STATUS OF CLAIMS**

This is an appeal from the rejection dated April 17, 2002, wherein claims 1-5, 19, 20 and 43 were rejected for the second time (see Office Action dated February 28, 2001, in the parent of this Continuation Application).

The present application was filed on May 10, 2001 with claims 1-5, 19, 20 and 43 (claims 6-18, 21-42 and 44-48 were allowed in the parent application, and thus were canceled in a Preliminary Amendment filed May 10, 2001). Claims 1, 2 and 20 were amended in the Preliminary Amendment filed May 10, 2001 to conform these claims to the Amendment filed December 14, 2000 in the parent of this Continuation Application. Also claim 43 was amended to address minor precision of language issues as agreed during the telephonic interview of May

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1, 2001 between the Examiner, Examiner's Supervisor and Appellants' representative. No amendments were made to the application after the May 10, 2001 Preliminary Amendment.

Claims 1-5, 19, 20 and 43 stand rejected under the doctrine of "double patenting" over claims 1-40 of U. S. Patent No. 6,307,987 B1, which is the parent of this continuation application. Appellants respectfully submit that this issue will be best addressed after all other patentability issues have been resolved, so that the claims are in their final form for comparison against claims 1-40 of U. S. Patent No. 6,307,987 B1. Appellants expect to file a terminal disclaimer to remove this rejection should these claims be found allowable in their present form.

Accordingly, claims 1-5, 19, 20 and 43 (see attached Appendix) are the claims currently on appeal, from the rejection under 35 U.S.C. §103(a) in view of Crossland et al. (WO 95/27920) and Appeldorn et al. (U.S. Patent No. 5,659,643).

#### **IV. STATUS OF AMENDMENTS**

A Preliminary Amendment was filed May 10, 2001 to cancel claims 6-18, 21-42 and 44-48 which were allowed in the parent application, to conform claims 1, 2 and 20 to the Amendment filed December 14, 2000 in the parent of this Continuation Application, and to address minor precision of language issue in claim 43. This Amendment has been entered (see Office Action mailed May 17, 2002).

## **V. SUMMARY OF THE INVENTION**

Appellants' invention is in the field of display devices and relates generally to the use of a luminescent compound radiated by energy propagated from the side of an optical fiber. One aspect of the invention provides a display matrix made from coincidentally-excited phosphors, while another aspect provides an optical switch. An advantage achieved by Appellants' invention is a very thin, light and durable panel that produces no electromagnetic interference or noise. (Appellant's specification, page 1, lines 9-24.)

In accordance with one of the aspects of the invention as illustrated in Fig. 1, an optical luminescent display device 30 comprises an optical fiber 32 that includes a notch 34. The notch 34 contains a luminescent material 36, such as a phosphor or other fluorescent material. This luminescent material 36 may be placed inside or outside the notch 34, such that the radiation provided through the optical fiber 32 is directed toward the luminescent material 36 causing the luminescent material 36 to emit visible light. (Appellant's specification, page 7, line 6 through page 10, line 21.)

In accordance with another aspect of the invention as illustrated in Fig. 6, an optical switch device 60 comprises an optical luminescent display device 30 provided with a luminescent material 36 and one or more optical pickups 62. The optical switch device 60 is activated when both types of radiation are provided within the optical fiber 32 to cause the luminescent material 36 to emit visible light. (Appellant's specification, page 13, line 1 through page 14, line 11.)

## **VI. ISSUE**

1. Whether claims 1-5, 19, 20 and 43, are unpatentable over the combination of Crossland et al. (Crossland) and Appeldorn et al. (Appeldorn) under 35 U.S.C. §103(a).

## **VII. GROUPING OF CLAIMS**

It is noted that the rejected independent claim 43 does not stand or fall together with the rejected claims 1-5, 19 and 20, but recites separately patentable features as set forth below (see pages 7 and 8 of Section VIII). Claims 1-5, 19 and 20 stand or fall together.

## **VIII. ARGUMENTS**

As explained in Appellants' December 14, 2000 Amendment filed in the parent application, Crossland and Appeldorn, alone or in any reasonable combination, do not teach or suggest an optical luminescent display device, comprising both a "luminescent material" and an "optical fiber", configured as recited in Appellants' independent claims 1, 3, 19 and 43, and do not teach or suggest a method for causing a luminescent material to emit visible light by

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“emitting radiant energy into an optical fiber” and “directing said radiant energy toward a luminescent material via a notch formed in said optical fiber”, as recited in Appellants’ claim 20.

In particular, Crossland discloses nothing more than a display screen which comprises “a backing layer (17) acting as a light guide for activating light” (*Id.*, Abstract). That is, nowhere does Crossland teach or suggest using anything other than “the lightguide substrate, indicated at 17” (*Id.*, page 15, lines 1-4; see *Id.* Figs. 2-15). In fact, Crossland, which is directed to various structures for the lightguide substrate layer, does not disclose, teach or suggest using anything other than layer 17 as a light guide for the activating light for phosphor-type light emitting elements in a liquid crystal display screen.

On the other hand, and contrary to the Examiner’s analysis, Appeldorn, which discloses using optical fibers, which having notches, as illumination devices, (see *Id.*, Figs. 1-6), does not disclose, teach or suggest using optical fibers as a light guide for the activating light for a phosphor-type light emitting element. That is, Appeldorn discloses illumination devices wherein the optical fibers themselves serve as visible light emitting elements. In Figure 4, Appeldorn illustrates a light fixture, which has “an array of fibers ... extruded or molded as one piece” (see *Id.*, col. 4, lines 32-41; see also col. 4, lines 59-65 and Fig. 6), and seeks to “optimize the performance of a lighting fixture utilizing the present invention” by, for example, proper selection of the angles of the sides of the notch formed in the fibers (see *Id.*, col. 2, line 62 through col. 4, lines 16).

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Therefore, while Appeldorn discloses using optical fibers as illumination devices, Appeldorn does not teach or suggest using optical fibers for delivering radiant energy to a luminescent material, as recited in Appellants' independent device claims 2, 3, 19 and 43, and does not teach or suggest directing radiant energy, emitted into an optical fiber, toward a luminescent material via a notch formed in the optical fiber, as recited in Appellants' method claim 20.

The Examiner alleges that, "[a] person of ordinary skill in the art would have found it obvious to apply teachings directed to one light guide to another light guide, regardless of the specific shape [i.e., light-guiding substrate or optical fiber]. Thus, the Examiner concludes that "[o]ne of ordinary skill in the art at the time of the invention would have found it obvious to incorporate an array of side-emitting optical fibers, as taught by Appeldorn, as a backing layer in the invention of Crossland et al." (Office Action paragraphs 12 and 13). However, this is not supported by the actual disclosure of either Appeldorn or Crossland. That is, as explained above, nowhere does Crossland teach or suggest having anything other than layer 17 as a light guide for providing activating light for "phosphor-type elements". On the other hand, Appeldorn specifically teaches to use optical fibers themselves as illumination devices, i.e., as direct sources of visible light. In fact, Appeldorn's entire disclosure is focused on designing optical fibers as light fixtures - "[i]t will be apparent to those skilled in the art that the present invention only affects collimation of the light in a plane parallel to the optical fiber" (see *Id.*, column 4, lines 51-58). Therefore, Appeldorn does not teach or suggest using optical fibers for providing activating



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light, but discloses that the light propagated through optical fibers is to be directly viewable. That is, in contradistinction to Appellants' claimed invention, Appeldorn does not teach or suggest, but teaches away from, a device and a method wherein radiant energy is emitted into an optical fiber, and is then directed via the optical fiber to a luminescent material.

Furthermore, the Examiner's allegation that "[o]ne of ordinary skill in the art would have recognized that any well known light guide could be incorporated as a backing layer in the invention of Crossland et al." (Office Action, paragraph 12), is not supported by any of the prior art reference. On the contrary, the function and operation of optical fibers, particularly notched optical fibers which are capable of selectively emitting light only at the notches thereof, is quite different from light-diffusing panels which receive light from a source and provide a plane of light as implemented in Crossland (see, e.g., Appeldorn, col. 1, line 64 through col. 2, line 9). The Examiner reference to Appeldorn's Figs. 5 and 6, which illustrate notched optical fibers having different cross-sections, does not bolster the Examiner's position because having different cross-sections does not change the fact that these notched optical fibers do not diffuse light to provide a plane of light, but selectively emit light only at the notches (see Appeldorn, col. 2, lines 53-61). Accordingly, Appeldorn's disclosure of notched optical fibers having different cross-sections does not in any way suggest that such notched optical fibers can somehow be used in place of a light-diffusing panel such as Crossland's backing layer. Thus, without the benefit of Appellants' own disclosure, one of ordinary skill in the art would not have been motivated to replace Crossland's layer 17 designed to illuminate, for example, all of the "lenslets" arranged in

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a two-dimensional array (see Crossland's Fig. 7) with an array of optical fibers wherein each fiber is designed to provide selective illumination only in one dimension, i.e., only at the notches thereof.

Finally, Appellants' independent claim 43 defined an optical switch which, in addition to the novel arrangement of a luminescent material and a notched optical fiber, also comprises an optical pickup arranged to optically communicate with the luminescent material. Neither Crossland nor Appeldorn discloses "an optical switch", let alone teaches or suggests an optical switch as claimed in Appellants' claim 43. The Examiner's assertion that "one of ordinary skill in the art would have found it obvious to incorporate an optical pickup in the invention of Crossland et al. to receive the light from the luminescent material" (Office Action, paragraph 16) finds no bases in any of the prior art references. In fact, as discussed above, Crossland does not disclose any luminescent material, but simply provides directly viewable light. Furthermore, one of ordinary skill in the art would have no reason for incorporating an optical pickup device in either Crossland's display screen or Appeldorn's illumination devices. Certainly neither Crossland, nor Appeldorn, teaches or suggests such an arrangement.

In summary, Appellants' claims 1, 3, 19, 20 and 43, as well as the dependent 4 and 5 (which incorporate all the novel and unobvious features of their base claim 3) would not have been obvious from Crossland and Appeldorn, at least for the reasons noted above.

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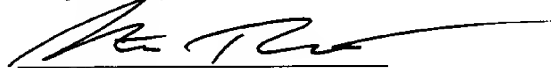
The present Brief on Appeal is being filed in triplicate. Unless a check is submitted herewith for the fee required under 37 C.F.R. §1.192(a) and 1.17(c), please charge said fee to Deposit Account No. 19-4880.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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